

1. (Twice Amended) A holographic image corrector for a microscope comprising,
- an optical system having an objective,
 - at least one pinhole mounted before said objective,
 - means for recording the characteristics of said objective by sending a first coherent beam through said pinhole and through said objective or reflecting said beam therefrom to form an object beam,
 - means for intersecting said object beam with a reference coherent beam in a recording medium to form a hologram of said objective,
 - means to replace said pinhole with an article and
 - means to illuminate said article with a coherent beam [like one of the above] of the same wavelength as one of the above coherent beams so that light therefrom passes through or reflects off said objective and diffracts through or off said hologram and provides a corrected image of said article.
2. (Twice amended) A holographic image corrector for a microscope comprising,
- an optical system having an objective,
 - a pinhole mounted before said objective,
 - means for recording the characteristics of said objective by sending a first coherent beam through said pinhole and through said objective or reflecting said beam therefrom to form an object beam,
 - means for intersecting said object beam with a reference coherent beam in a recording medium to form a hologram of said objective,
 - means to replace said pinhole with an article and
 - means to illuminate said article with a coherent beam [like one of the above] of

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the same wavelength as one of the above coherent beams so that light therefrom passes through or reflects off said objective and diffracts through or off said hologram and provides a corrected image of said article.

- ~~inventor's name~~ C & D
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15. (Twice amended) A method for image correction in a microscope comprising,
- recording the characteristics of an optical system having an objective, by sending a first coherent beam through a pinhole and through said objective or reflecting said first beam therefrom to form an object beam,
 - intersecting said object beam with a reference coherent beam in a recording medium to form an interference pattern or hologram thereof,
 - replacing said pinhole with an article and
 - illuminating said article with a coherent beam [like one of the above] that is, of the same wavelength as one of the above coherent beams so that light therefrom passes through or reflects off said objective and diffracts through or off said hologram, to provide a corrected image of said article.

- ~~inventor's name~~ C & D
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18. (Twice amended) A method for image correction in a microscope comprising,
- passing a coherent beam through a beam splitter to form separate beams 1 & 2,
 - directing beam 1 through a first pinhole to illuminate an objective and define an object beam,
 - directing beam 2 through a second pinhole to a collimating lens to define a reference beam and then into interference with said object beam in a recording medium to define a hologram,
 - removing said first pinhole before said objective and replacing said pinhole

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with the article to be viewed and

- e) illuminating said article by a coherent beam [like the above] of the same wavelength as one of the above coherent beams so that light therefrom passes through or reflects off said objective and through an imaging lens to diffract through or off said hologram to reconstruct the original reference beam but with article information retained, to correct for defects in said objective and to provide an accurate image in a recording medium or for viewing.

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19. In claim 19, line 1, after "maker", insert --for a microscope--.

20. In claim 20, line 1, after "hologram", insert --for a microscope--.

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21. (Twice amended) A holographic image corrector for a microscope comprising,

- a) an optical system having an objective
- b) an array of pinholes mounted before said objective,
- c) means for recording the characteristics of said objective by sending a first coherent beam through said array and through said objective or reflecting said beam therefrom to form an object beam and
- d) means for intersecting said object beam with a reference coherent beam in a recording medium to form a hologram of said objective,
- e) means to replace said array with an article and
- f) means to illuminate said article with a coherent beam [like one of the above] of the same wavelength as one of the above coherent beams so that light therefrom passes through or reflects off said objective and diffracts through or off said hologram and provides a corrected image of said article.

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32. (Twice amended) A method for image correction in a microscope comprising,

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- a) recording the characteristics of an optical system having an objective, by sending a first coherent beam through an array of pinholes and through said objective or reflecting said first beam therefrom to form an object beam,
 - b) intersecting said object beam with a reference coherent beam in a recording medium to form an interference pattern or hologram thereof,
 - c) replacing said array with an article and
 - d) illuminating said article with a coherent beam [like one of the above] of the same wavelength as one of the above coherent beams so that light therefrom passes through or reflects off said objective and diffracts through or off said hologram, to provide a corrected image of said article.

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36. (Twice amended) The method of claim 32 wherein [when an array of pinholes is employed in the object beam before said objective and in the reference beam, and when said object beam is passed through said hologram,] during step d) thereof, said reference beam is also directed at such hologram as before to form an interference pattern of light and dark fringes superimposed on said image, to provide a contour plot thereof.

37. (Twice Amended) A method for image correction in a microscope comprising,

- a) passing a coherent beam through a beam splitter to form separate beams 1 & 2,
- b) directing beam 1 through a first array of pinholes to illuminate an objective and define an object beam,
- c) directing beam 2 through a second array of pinhole to a collimating lens to define a reference beam and then into interference with said object beam in a recording medium to define a hologram,